GRIFFIN INTERNATIONAL INC

March 22, 1999

Mr. Chuck Schwer
VTDEC/ANR/WMD
103 South Main Street, West Building
Waterbury, VT 05671-0404

Re: Site Investigation Report, M&R Beverage, Highgate, Vermont
VTDEC Site #98-2371

Dear Mr. Schwer:

Enclosed please find the document titled *Report on the Subsurface Investigation of Suspected Petroleum Contamination at M&R Beverage, Gore Road, Highgate Center, Vermont*. This report has been submitted to the VTDEC for review on behalf of Mr. Mike Fontaine of Highgate, Vermont. Work was performed at the site in accordance with Griffin's October 13, 1998, *Work Plan and Cost Estimate*, which was approved by you in a letter dated October 29, 1998.

Thank you for your time. Please feel free to call me at (802) 865-4288 if you have any questions.

Sincerely,

Willis Doe
Environmental Engineer

Enclosure

c: GI Project #89841354

P.O. Box 943 • Williston, VT 05495 • Phone/Fax 802-865-4288
59 Clinton Street • Plattsburgh, NY 12901 • 518-562-4666 • Fax 518-561-6832

REPORT ON THE SUBSURFACE INVESTIGATION OF SUSPECTED PETROLEUM CONTAMINATION at M & R BEVERAGE GORE ROAD HIGHGATE CENTER, VERMONT VTDEC SMS #98-2371

February, 1998

Prepared for:

M&R Beverage, Inc.

PO Box 154
Highgate Center, VT 05439

Prepared by:

GRIFFIN INTERNATIONAL

P.O. Box 943
Williston, Vermont 05495
(802) 865-4288

Griffin Project #: 89841354

TABLE OF CONTENTS

APPENDICES

I. INTRODUCTION

This report summarizes the investigation of suspected subsurface petroleum contamination at M&R Beverage, Gore Road, Highgate Center, Vermont. The facility is owned by M&R Beverage, Inc., Highgate Center, Vermont. The following investigation has been conducted to define more clearly the degree and extent of petroleum contamination detected in the soils at this site during the in-place closure of one (1) 1000 gallon kerosene underground storage tank (UST) on April 14, 1998. Included in this report are the results of groundwater sampling conducted at the property, an evaluation of potential sensitive receptors in the area, conclusions drawn from data collected at the site, and recommendations regarding future work at the site.

This work has been completed for M&R Beverage, Inc., by Griffin International, Inc. (Griffin) in accordance with the Work Plan and Cost Estimate, Subsurface Investigation of Suspected Petroleum Contamination dated July 6, 1998, and approved by Mr. Chuck Schwer of the Vermont Department of Environmental Conservation (VTDEC) in a letter to Mr. Mike Fontaine, M&R Beverage, dated October 29, 1998.

II. BACKGROUND

On April 14, 1998, one (1) 1000 gallon diesel fuel UST was closed in-place at the M&R Beverage facility on Gore Road in Highgate Center, Vermont. Marin Environmental of Burlington, Vermont, performed the closure assessment for this UST.[1] During the closure, petroleum contamination was observed in soils at depths of 2' to 6' below grade. A photoionization device (PID) was utilized to perform headspace screening of soil samples. A maximum volatile organic compound (VOC) concentration of 202 ppm was detected in this depth interval adjacent to the UST. Groundwater was not encountered during the closure of this UST.

A report detailing the findings of this UST closure was submitted by Marin Environmental on May 1, 1998. In a letter dated June 14, 1998, Mr. Bob Butler of the VTDEC requested that the following work be performed at the site:

- Further definition of degree and extent of contamination to soil.
- Definition of degree and extent of petroleum contamination to groundwater at the site, if any.
- If appropriate, screening (using a PID) of on-site and adjacent buildings and structures to determine if they have been impacted by petroleum vapors.
- Assessment of the potential for contamination to impact sensitive receptors.
- Determine need for long-term treatment/monitoring at the site.
- Submittal of a summary report (this document) which outlines the work performed, provides necessary analytical data, maps, and supporting arguments for conclusions and recommendations.

Griffin International was retained by M&R Beverage, Inc., to perform this work.

III. SITE DESCRIPTION

The site is located on Gore Road just off Route 78 in the Village of Highgate Center, Vermont. The surrounding area is primarily residential and commercial. The property is relatively flat topographically and sits at an elevation of approximately 300 feet above mean sea level[2]. The site and surrounding residential and commercial properties are supplied with water by private supply wells.

The Surficial Geologic Map of Vermont depicts the surrounding area as pebbly marine sand.[3] Actual subsurface materials were not observed during activities at the site. The Centennial Geologic Map of Vermont depicts bedrock beneath the site as part of the Highgate formation, consisting primarily of banded blue limestone and calcareous slate.[4]

IV. MONITORING WELLS

On September 17, 1993, four (4) soil borings were advanced into the subsurface at the site by Green Mountain Boring, Inc., now of East Montpelier, Vermont, using a truck-mounted, 4.25" inside diameter (ID) hollow-stem auger drill rig. Each boring was advanced to a depth of approximately 20' below grade. Monitoring wells were installed in each of the four borings. One of the wells was destroyed during the 1998 installation of new USTs at the site. The monitoring wells, designated MW-1 through MW-4, were installed for leak detection purposes in the vicinity of the USTs at the site.

MW-1 was installed downgradient of the former 1000 gallon kerosene UST at the site, and MW-2 and MW-3 were installed downgradient of both the 1000 gallon kerosene and the two (2) 4000 gallon and one (1) 10,000 gallon gasoline USTs at the site. Monitoring well construction and soil boring logs are not available for inclusion in this report.

V. WATER LEVELS AND WATER QUALITY

A. Water Table Elevations

Water table elevation measurements were collected from MW-1 through MW-3 on January 22, 1999. In addition, the monitoring wells were surveyed in azimuth and elevation relative to the top of the PVC riser pipe of MW-1, which has been assigned an arbitrary elevation of 100.00 feet. Liquid level monitoring data are presented in Appendix B.

Water table elevations have been plotted and contoured to illustrate the estimated gradient and direction of groundwater flow beneath the site (see Groundwater Contour Map, Appendix A). According to these data, groundwater is flowing south across the site toward the Missisquoi River at a hydraulic gradient of 1.4%. The placement of the monitoring wells at the site is believed adequate to assess the potential impact of

contamination suspected at the site. Please refer to the site map in Appendix A for the placement of these monitoring wells.

B. Water Quality

Griffin collected groundwater samples from each of the monitoring wells at the site on January 22, 1999. Collected groundwater samples were analyzed for VOCs by EPA Method 8021B and total petroleum hydrocarbons (TPH) by EPA Method 8015.

Benzene, toluene, ethylbenzene, xylenes (BTEX), 1, 2, 4 and 1,3,5 trimethyl benzene, naphthalene, methyl-tertiary butyl ether (MTBE), and TPH were not detected above method detection limits in the samples collected from the monitoring wells. The trip blank and duplicate sample analytical results indicate that proper quality assurance and quality control were maintained during the sampling and analysis. All samples were collected in accordance with Griffin protocols which comply with applicable state and industry standards.

C. Supply Well Sampling and Analysis

In conjunction with monitoring well sampling, samples were also collected from the supply well present at the site on January 22, 1999. The supply well is completed in bedrock and is located south of the M&R Beverage building in a crossgradient direction from the USTs at the site. Samples collected from this well were analyzed for VOCs by EPA Method 8021B and for TPH by EPA Method 8015. None of the compounds detected by these analyses were present in the supply well samples.

VI. RECEPTOR RISK ASSESSMENT

Petroleum contamination at the site appears to be limited to soils in the direct vicinity of the closed-in-place 1000 gallon former kerosene UST, as contamination was not detected in groundwater samples collected from the on-site monitoring wells, or in samples collected from the on-site drinking supply well. Risk posed to human health and/or the environment as a result of this contamination appears to be minimal. The closest potential receptors of this contamination are the airspace within M&R Beverage (which has no basement), groundwater beneath the site, and the crossgradient supply well.

The airspace within M&R Beverage was screened for the presence of VOCs on January 22, 1999. An H-Nu™ Model HW-101 photoionization detector (PID) was used to screen ambient air throughout the store. No VOCs were detected with the PID at this time. As previously mentioned, petroleum compounds were not detected in the monitoring wells or the supply well in samples collected on January 22, 1999.

VII. CONCLUSIONS

Based on the investigation at this site, Griffin has reached the following conclusions:

1. The release of kerosene detected during the in-place closure of the 1000 gallon UST at the site appears to be limited in nature and confined to soils in the direct vicinity of the aforementioned UST.

2. The water table elevation beneath the site, as measured using the interface probe, ranged from approximately 16.2' to 17.1' below grade on January 22, 1999. Based on the water table elevation data collected at that time, groundwater beneath the site is flowing south at a hydraulic gradient of approximately 1.4%.

3. Dissolved VOCs were not detected in the groundwater samples collected from wells MW-1, MW-2, and MW-3, or from the sample collected from on-site supply well. VOCs were not detected during PID screening activities of ambient air inside M&R Beverage.

4. The risk assessment for this site has determined that there is likely limited risk to the on-site drinking water supply, the airspace within M&R Beverage, or groundwater beneath the site.

5. As the source of the petroleum release has been removed it is expected that the apparently limited amount of residual petroleum in soil at the site will eventually be reduced by the natural processes of dilution, dispersion, and biodegradation.

IX. RECOMMENDATIONS

1. Based on the above conclusions, Griffin recommends that additional groundwater monitoring and supply well sampling be discontinued at the site, and the site be designated Sites Management Activity Completed (SMAC) by the VTDEC. The site meets the following criteria required by the VTDEC for SMAC characterization.

- The source (1000 gallon kerosene UST) has been pumped free of product, cleaned, and closed in-place at the site;
- VOCs and TPH were not detected in the samples collected on January 22, 1999 in groundwater and drinking water at the site;
- Petroleum contamination present in soils in the vicinity of the closed in-place 1000 gallon kerosene UST at the site appears to be very limited in nature and does not pose a threat to groundwater beneath the site, based on the results of groundwater sampling and analysis;
- As evidenced by PID screening conducted on January 22, 1999, ambient indoor air in the M&R Beverage facility does not appear to be adversely impacted by the petroleum present in subsurface soils at the site.

REFERENCES

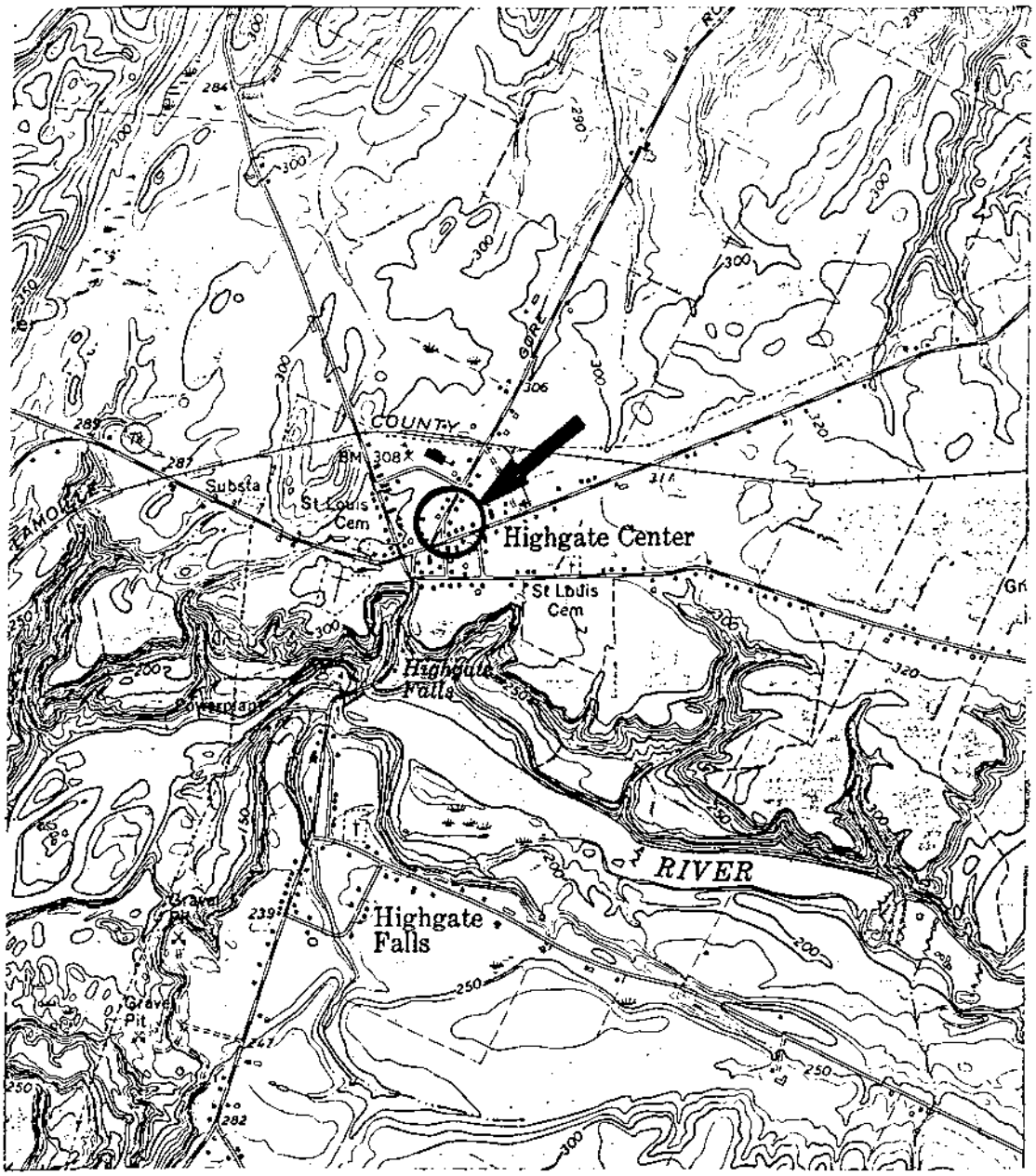
1. Butler, Bob, June 14, 1998, letter to Mr. Mike Fontaine.
2. United States Department of the Interior, Geological Survey, ed., 1972, Topographic Map, Highgate Center Quadrangle, Vermont.
3. Doll, Charles G., ed., 1970, *Surficial Geologic Map of Vermont*, State of Vermont.
4. Doll, Charles G., ed., 1970, *Centennial Geologic Map of Vermont*, State of Vermont.

APPENDICES

APPENDIX A

Maps

Site Location Map
Area Map
Site Map
Groundwater Contour Map



SOURCE: USGS- HIGHGATE CENTER, VERMONT QUADRANGLE

JOB #: 8981354

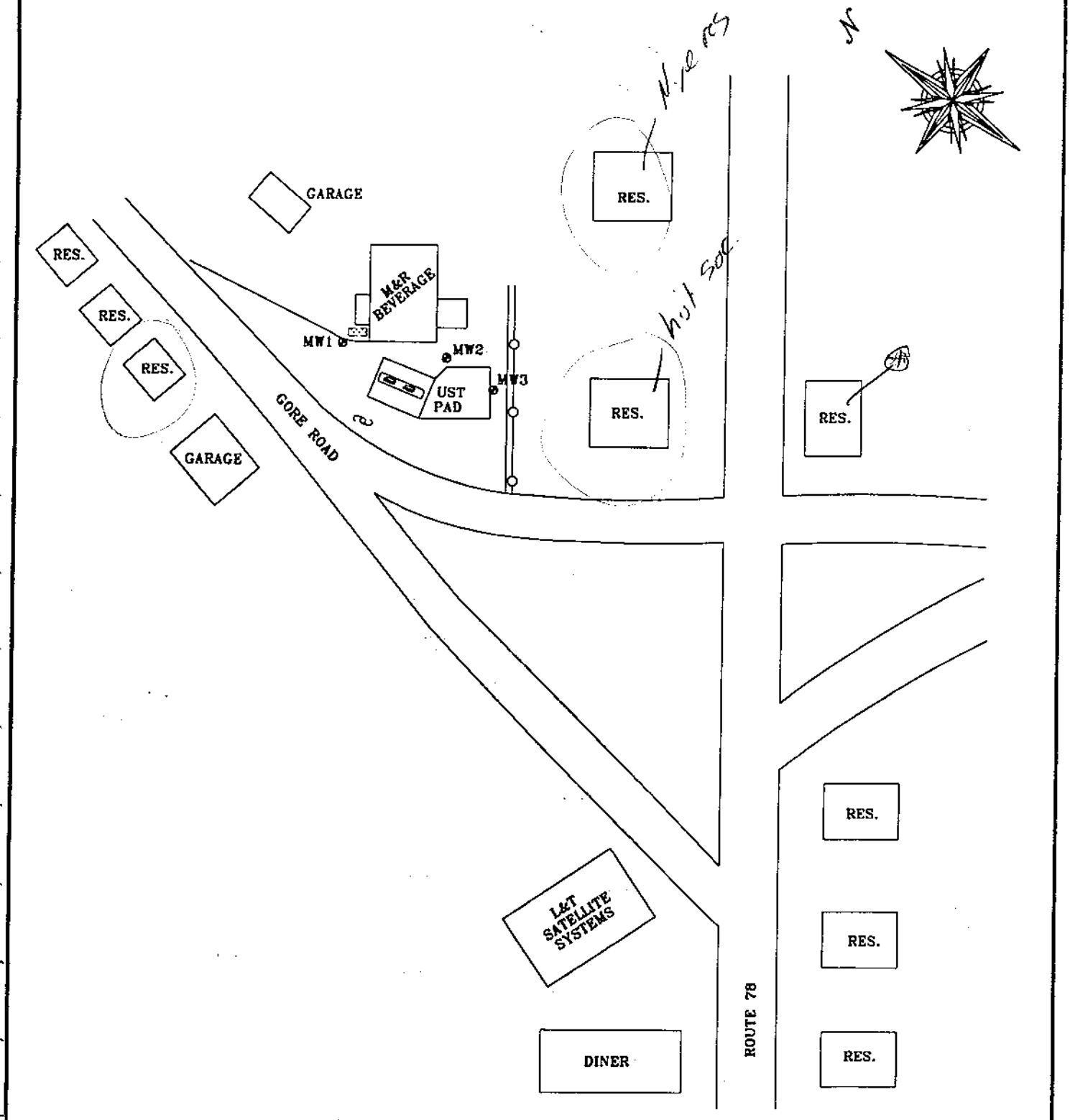
GRIFFIN INTERNATIONAL INC

M&R BEVERAGE

HIGHGATE, VERMONT

SITE LOCATION MAP

DATE: 12/28/98	DWG.#:1	SCALE: 1:24000	DRN.:SB	APP.:WD



JOB #: 89841354

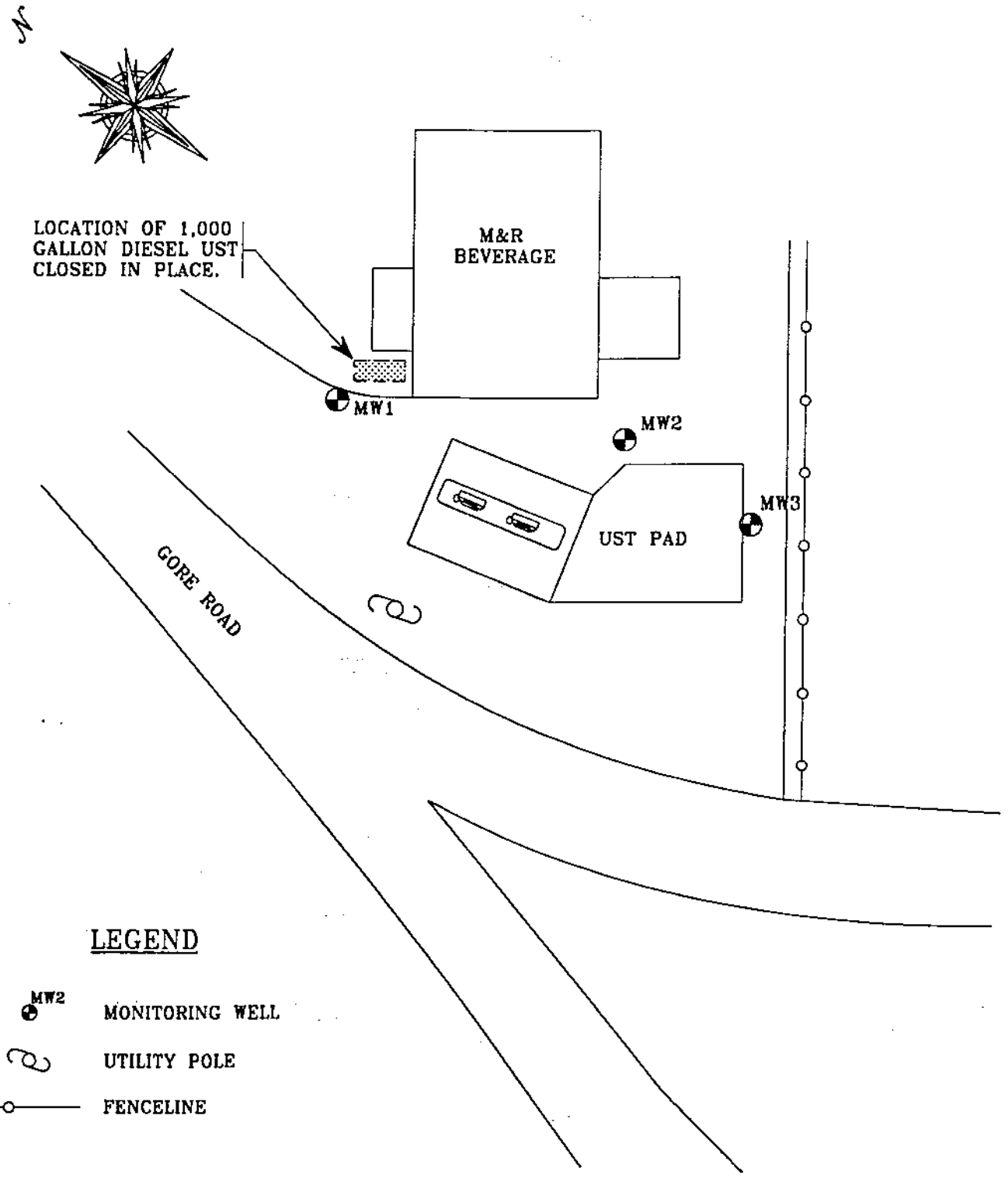
GRIFFIN INTERNATIONAL INC

M&R BEVERAGE

HIGHGATE, VERMONT

AREA MAP

DATE: 2/15/99	DWG.#:2	SCALE: NONE	DRN.:SB	APP.:WD



JOB #: 89841354

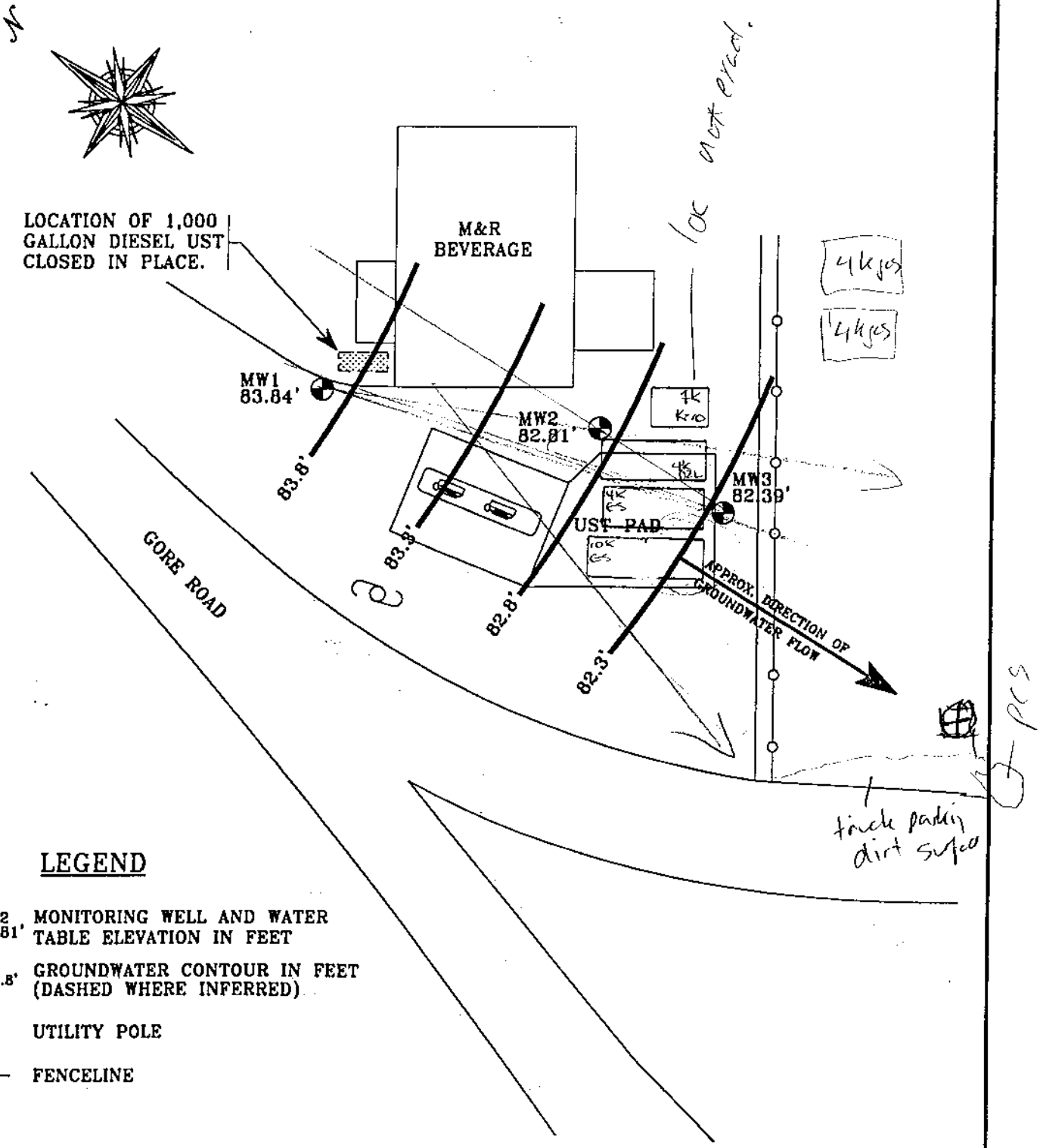
GRIFFIN INTERNATIONAL INC

M&R BEVERAGE

HIGHGATE, VERMONT

SITE MAP

DATE: 2/15/99	DWG.#:3	SCALE: 1"=30'	DRN.:SB	APP.:WD



JOB #: 89841354

GRIFFIN INTERNATIONAL INC

M&R BEVERAGE

HIGHGATE, VERMONT

GROUNDWATER CONTOUR MAP MEASUREMENT DATE: 1/2/99

DATE: 2/15/99	DWG.#:4	SCALE: 1"=30'	DRN.:SB	APP.:WD

APPENDIX B

Liquid Level Monitoring Data

Liquid Level Monitoring Data
M&R Beverage, Highgate Center, Vermont

1/22/99

Well I.D.	Top of Casing Elevation	Depth To Product	Depth To Water	Product Thickness	Specific Gravity Of Product	Water Equivalent	Corrected Depth To Water	Corrected Water Table Elevation
MW-1	100.00		16.16					83.84
MW-2	99.87		17.06					82.81
MW-3	99.30		16.91					82.39

All Values Reported in Feet

Top-of-Casing Elevations Measured in Feet Relative to MW-1 set at 100.00'

APPENDIX C

Laboratory Report

ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

REPORT OF LABORATORY ANALYSIS

CLIENT: Griffin International
PROJECT NAME: M&R Beverage/#89841354
REPORT DATE: February 3, 1999
DATE SAMPLED: January 22, 1999

PROJECT CODE: 1148
REF.#: 134,144 - 134,149

Enclosed please find the results of the analyses performed for the samples referenced on the attached chain of custody. Chain of custody indicated sample preservation with HCl.

All samples were prepared and analyzed by requirements outlined in the referenced method and within the specified holding times. All instrumentation was calibrated with the appropriate frequency and verified by the requirements outlined in the referenced method. Blank contamination was not observed at levels affecting the analytical results.

Analytical method precision and accuracy was monitored by laboratory control standards which included matrix spike, duplicate and quality control analyses. These standards were determined to be within established laboratory method acceptance limits.

Individual sample performance was monitored by the addition of surrogate analytes to each sample. All surrogate recovery data was determined to be within laboratory QA/QC guidelines unless otherwise noted.

Reviewed by,

Harry B. Locker, Ph.D.
Laboratory Director

enclosures

ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

EPA METHOD 8021B--PURGEABLE AROMATICS

CLIENT: Griffin International
PROJECT NAME: M&R Beverage/#89841354
CLIENT PROJ. #: 89841354

DATE RECEIVED: January 25, 1999
REPORT DATE: February 3, 1999
PROJECT CODE: 1148

Ref. #:	134,144	134,145	134,146	134,147	134,148
Site:	MW-1	MW-2 Dupe	MW-2	MW-3	Trip Blank
Date Sampled:	1/22/99	1/22/99	1/22/99	1/22/99	1/22/99
Time Sampled:	11:13	11:03	11:03	10:50	8:20
Sampler:	W.J.D.	W.J.D.	W.J.D.	W.J.D.	W.J.D.
Date Analyzed:	2/2/99	2/2/99	2/3/99	2/2/99	2/2/99
UIP Count:	0	0	0	0	0
Dil. Factor (%):	100	100	100	100	100
Surr % Rec. (%):	97	98	96	98	98
Parameter	**Conc. (ug/L)**	**Conc. (ug/L)**	**Conc. (ug/L)**	**Conc. (ug/L)**	**Conc. (ug/L)**
MTBE	<10	<10	<10	<10	<10
Benzene	<1	<1	<1	<1	<1
Toluene	<1	<1	<1	<1	<1
Ethylbenzene	<1	<1	<1	<1	<1
Xylenes	<1	<1	<1	<1	<1
1,3,5 Trimethyl Benzene	<1	<1	<1	<1	<1
1,2,4 Trimethyl Benzene	<1	<1	<1	<1	<1
Naphthalene	<1	<1	<1	<1	<1

Ref. #:	134,149
Site:	Supply Well
Date Sampled:	1/22/99
Time Sampled:	11:30
Sampler:	W.J.D.
Date Analyzed:	2/3/99
UIP Count:	0
Dil. Factor (%):	100
Surr % Rec. (%):	98
Parameter	**Conc. (ug/L)**
MTBE	<10
Benzene	<1
Toluene	<1
Ethylbenzene	<1
Xylenes	<1
1,3,5 Trimethyl Benzene	<1
1,2,4 Trimethyl Benzene	<1
Naphthalene	<1

Note: UIP = Unidentified Peaks TBQ = Trace Below Quantitation NI = Not Indicated

ENDYNE, INC.

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333

84541354

CHAIN-OF-CUSTODY RECORD

20 3 1224

Project Name: M+R BEVERAGE Site Location: HIGHGATE	Reporting Address: GRIFFIN	Billing Address:
Endyne Project Number: 1148	Company: GRIFFIN Contact Name/Phone #: 802 866 4288	Sampler Name: WJD Phone #: 802 866 4288

Lab #	Sample Location	Matrix	GRAB	COMP	Date/Time 1/22/99	Sample Containers No.	Type/Size	Field Results/Remarks	Analysis Required	Sample Preservation	Rush
134144	MW-1	GW	✓		11:13	2	40 ml VOA		TPH AS DIESEL - 8015 VOC BY 8020	HCl	
134145	MW-2 DUPE	GW			11:03						
134146	MW-2	GW			11:03						
134147	MW-3	GW			10:50						
134148	TRIP BLANK	DIST H2O			08:00						
134149	SUPPLY WELL	DW			11:30						

Change 8020 to 8021B as per WJD 1/28/99

Relinquished by: Signature [signature]	Received by: Signature [signature] Desvoskey	Date/Time 1/22/99 16:00
Relinquished by: Signature [signature] Desvoskey	Received by: Signature [signature]	Date/Time 1-25-99 10:15

New York State Project: Yes _____ No _____

Requested Analyses

1	pH	6	TKN	11	Total Solids	16	Metals (Specify)	21	EPA 624	26	EPA 8270 B/N or Acid
2	Chloride	7	Total P	12	TSS	17	Coliform (Specify)	22	EPA 625 B/N or A	27	EPA 8010/8020
3	Ammonia N	8	Total Diss. P	13	TDS	18	COD	23	EPA 418.1	28	EPA 8080 Pest/PCB
4	Nitrite N	9	BOD_5	14	Turbidity	19	BTEX	24	EPA 608 Pest/PCB		
5	Nitrate N	10	Alkalinity	15	Conductivity	20	EPA 601/602	25	EPA 8240		
29	TCLP (Specify: volatiles, semi-volatiles, metals, pesticides, herbicides)												
30	Other (Specify)												

ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

LABORATORY REPORT

CLIENT: Griffin International
PROJECT: M&R Beverage/#89841354
REPORT DATE: February 8, 1999

ORDER ID: 1148
DATE RECEIVED: January 25, 1999

Enclosed please find the results of the analyses performed for the samples referenced on the attached chain of custody. Different groups of analyses may be reported under separate cover.

All samples were prepared and analyzed by requirements outlined in the referenced methods and within the specified holding times.

All instrumentation was calibrated with the appropriate frequency and verified by the requirements outlined in the referenced methods.

Blank contamination was not observed at levels affecting the analytical results.

Analytical method precision and accuracy was monitored by laboratory control standards which included matrix spike, duplicate and quality control analyses. These standards were determined to be within established laboratory method acceptance limits, unless otherwise noted.

Reviewed by,

Harry B. Locker, Ph.D.
Laboratory Director

enclosures

ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

LABORATORY REPORT

CLIENT: Griffin International
PROJECT: M&R Beverage/#89841354
REPORT DATE: February 8, 1999

ORDER ID: 1148
DATE RECEIVED: January 25, 1999
SAMPLER: WJD
ANALYST: 820

Ref. Number: 134144 | Site: MW-1 | Date Sampled: January 22, 1999 | Time: 11:13 AM

Parameter	Result	Unit	Method	Analysis Date
TPH 8015 DRO	< 0.4	mg/L	SW 8015	2/5/99

Ref. Number: 134145 | Site: MW-2 Dupe | Date Sampled: January 22, 1999 | Time: 11:03 AM

Parameter	Result	Unit	Method	Analysis Date
TPH 8015 DRO	< 0.8	mg/L	SW 8015	2/5/99

Ref. Number: 134146 | Site: MW-2 | Date Sampled: January 22, 1999 | Time: 11:03 AM

Parameter	Result	Unit	Method	Analysis Date
TPH 8015 DRO	< 0.4	mg/L	SW 8015	2/5/99

Ref. Number: 134147 | Site: MW-3 | Date Sampled: January 22, 1999 | Time: 10:50 AM

Parameter	Result	Unit	Method	Analysis Date
TPH 8015 DRO	< 0.4	mg/L	SW 8015	2/5/99

Ref. Number: 134148 | Site: Trip Blank | Date Sampled: January 22, 1999 | Time: 8:20 AM

Parameter	Result	Unit	Method	Analysis Date
TPH 8015 DRO	< 0.4	mg/L	SW 8015	2/5/99

ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

Ref. Number: 134149 Site: Supply Well Date Sampled: January 22, 1999 Time: 11:30 AM

Parameter	Result	Unit	Method	Analysis Date
TPH 8015 DRO	< 0.4	mg/L	SW 8015	2/5/99

ENDYNE, INC.

32 James Brown Drive
Williston, Vermont 05495
(802) 879 4333

89841354

CHAIN-OF-CUSTODY RECORD

2053 32247

Project Name: M+R BEVERAGE Site Location: HIGHGATE	Reporting Address: GRIFFIN
Endyne Project Number: 1148	Company: GRIFFIN Contact Name/Phone #: WJD / 802 [illegible]

Billing Address:

Sampler Name: WJD
Phone #: 802 660 4288

Lab #	Sample Location	Matrix	GRAB	COMP	Date/Time 1/22/99	Sample Containers No.	Sample Containers Type/Size	Field Results/Remarks	Analysis Required	Sample Preservation	Rush
134144	MW-1	GW	✓		11:19	2	40 ml VOA		TPH AS DIESEL - 8015 VOC 8020	HCl	
134145	MW-2 DUPE	GW			11:25						
134146	MW-2	GW			11:03						
134147	MW-3	GW			10:50						
134148	TRIP BLANK	DIST H2O	✓		0820						
134149	SUPPLY WELL	DW	✓		11:30	✓	✓				
									2		
									Change 8020 to 8021B WJD 1/28/99		
									2		

Relinquished by: Signature	[signature]	Received by: Signature	[signature]
Relinquished by: Signature	[signature]	Received by: Signature	[signature]

Date/Time	1/27/99 1600
Date/Time	1-25-99 10:15

New York State Project: Yes ____ No ____

Requested Analyses

1	pH	6	TKN	11	Total Solids	16	Metals (Specify)
2	Chloride	7	Total P	12	TSS	17	Coliform (Specif
3	Ammonia N	8	Total Diss. P	13	TDS	18	COD
4	Nitrite N	9	BOD_5	14	Turbidity	19	BTEX
5	Nitrate N	10	Alkalinity	15	Conductivity	20	EPA 601/602
29	TCLP (Specify: volatiles, semi-volatiles, metals, pesticides, herbicides)						
30	Other (Specify)						

21	EPA 624	26	EPA 8270 B/N or Acid
22	EPA 625 B/N or A	27	EPA 8010/8020
23	EPA 418.1	28	EPA 8080 Pest/PCB
24	EPA 608 Pest/PCB		
25	EPA 8240		